

CLAIMS

What is claimed is:

1. A wave energy harvester comprising:
an at least partially submersed amplifier element, wherein the element is functionally coupled to a generator such that at least a portion of vertical movement of the element actuates the generator; and
wherein the amplifier element has a shape effective to translate forward velocity of water of a wave relative to the element into an upward force of the element.
2. The wave energy harvester of claim 1 wherein the shape of the amplifier element has a hydrofoil shape or a hull shape.
3. The wave energy harvester of claim 1 wherein the amplifier element has a neutral buoyancy.
4. The wave energy harvester of claim 1 wherein the generator comprises an electric generator.
5. The wave energy harvester of claim 1 further comprising a structure that retains the harvester in a laterally fixed position relative to a sea floor, and that allows vertical movement of the amplifier element relative to the sea floor.
6. A wave energy harvester comprising a hydrofoil element that produces a bi-directional vertical force from a horizontal motion of water of a wave, wherein the bi-directional force is directed upwards as the wave approaches a peak and directed downwards as the wave approaches a trough.
7. The wave energy harvester of claim 6 wherein the hydrofoil element is completely submersed.
8. The wave energy harvester of claim 6 wherein the hydrofoil element is coupled to a buoyant element that is at least partially submersed.
9. The wave energy harvester of claim 6 further comprising a generator that is actuated using at least part of the bi-directional force.

10. The wave energy harvester of claim 6 further comprising a structure that retains the harvester in a fixed relationship to a sea floor, and that further restricts movement of the hydrofoil element to substantially vertical movement.
11. A floating device comprising a hydrofoil configured to reduce or amplify a buoyant force of a wave passing the device.
12. The floating device of claim 11 comprising a frame to which the hydrofoil is coupled and that is configured to allow change of a pitch angle of the hydrofoil relative to a plane normal to a direction of the wave to thereby effect at least one of reduction and amplification of the buoyant force.
13. The floating device of claim 11 further comprising a structure that retains the device in a fixed relationship to a sea floor, and that further restricts movement of the hydrofoil to substantially vertical movement.
14. The floating device of claim 13 further comprising a generator that is actuated at least in part by the substantially vertical movement.
15. A wave energy harvester comprising a neutral buoyancy body coupled to an amplifier element that is configured such that the element and the body is raised by forward water motion of a wave moving past the harvester, and such that energy is extracted by resisting lowering of the neutral buoyancy body and amplifier element following passage of the wave.
16. The wave energy harvester of claim 15 wherein the amplifier element comprises a hydrofoil.
17. The wave energy harvester of claim 15 wherein the energy is extracted using a turbine that is coupled to the neutral buoyancy body.
18. The wave energy harvester of claim 15 wherein the entire wave energy harvester has neutral buoyancy and is configured such that the harvester becomes submerged when a storm churns a water surface to thereby reduce density of the surface.

19. A wave energy harvester having neutral buoyancy, wherein the wave energy harvester is further configured such that the harvester becomes submerged when a storm churns a water surface to thereby reduce density of the surface.
20. The wave energy harvester of claim 19 further comprising a hydrofoil.
21. The wave energy harvester of claim 19 wherein the harvester is configured such that neutral or negative buoyancy is achieved by at least temporarily reducing positive buoyancy of the harvester.